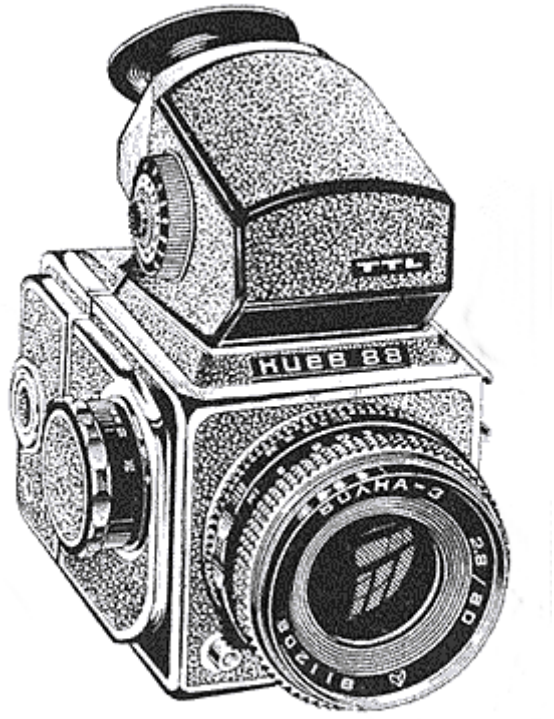
Salyut, Zenith 80, Kiev 80/88



Repair hints and tips

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Table Of Contents

Table Of Contents 1
Before you start 3
The cameras 3
  Introduction 3
  Using and caring for the camera. 3
  Servicing. 4
How the camera works 5
  Tensioning of the blinds. 5
  Speed selection/winding mechanism. 5
  Firing the shutter 7
Camera disassembly 8
  Basic disassembly and repair 8
    Before you even start… 8
    Remove the focussing screen. 8
    Remove the mirror. 8
    Remove the internal light baffles 8
  Inspect the camera. 8
    Lubricate the camera. 9
    Exercise the shutter 9
    There is still a problem…. 9
  Removing the chassis from the body. 10
  Further disassembly 11
Cleaning 12
  Materials 12
  Cleaning. 12
  Lubrication 12
Help with correctly setting the shutter up on Kiev 80/88/Salut 13
  To get the stacked gear speed set to ‘B’. 13
  Now to align the winding gear correctly. 13
Re-fitting the winding gear – Zenith 80 and early Salyut. 14
Re-fitting the winding gear – Zenith 80 and early Salyut. 15
Re-fitting the winding gear – Salyut ‘C’, Kiev 80/88 15
Re-fitting the winding gear – Salyut ‘C’, Kiev 80/88 16
Faults and how to correct them 17
Faults and how to correct them 17
  There is no shutter gap when the shutter is fired 17
  The shutter jams partly open 17
  ARAX MLU (Mirror Lockup) conversion 19
    Faults with the MLU 19
Re-fitting the chassis into the body. 20

Before you start

WARNING WARNING WARNING WARNING WARNING…..

1. These cameras are EXTREMELY complex.
2. You undertake ANY work in this document **AT YOUR OWN RISK.**
3. I STRONGLY recommend that, if you have a good camera which has developed a fault, you send it to a competant repairer such as ARAX.
4. This guide is designed for people who have bought a camera with the intention of repairing it themselves.
5. **Please note that many of the pictures are high resolution so you can zoom in to see close detail.**

The cameras

Introduction

Zenith 80, Salyut and Kiev 80/88 cameras have gained a justifiable reputation for unreliability. It is my own opinion that this is caused by a mix of:

- Poor engineering of the original components,
- Low quality control during assembly resulting in incorrect tolerances,
- Poor test/inspection before sale.

Add to that unsympathetic use and no regular maintenance (these cameras do need servicing every few years) and that bargain buy can turn into a disaster.

The secret of rewarding Zenith/Salyut/Kiev photography is to get a reliable, well assembled, well looked after camera. The only real way to do this is to 'try before you buy'.

It is extremely difficult, if not impossible, to make a good camera from a bad one.

Using and caring for the camera.

These cameras should be used with great care.

- Do not force anything – take your time changing lenses and backs.
- NEVER change the shutter speeds before winding the shutter, damage WILL occur if you try.
- Wind the shutter slowly and progressively, in one go if you can. Twisting the camera in the left hand whilst turning the advance with the right will achieve this.
- A personal opinion here but do NOT use a fast action crank. I think it puts a huge strain on the gearing inside the camera.
- Invest in a rear cover to fit when the back is off. It is very easy to damage the stainless steel blinds.
- The design of the backs makes them vulnerable to dust getting into the gears via the exposed gear. Keep them clean and away from dusty environments when off the camera.
- The open design of the camera makes them equally susceptible to dust and damp. Similar precautions apply.
- Every so often wipe the camera lens mount, and the lens thread itself, with a lint-free cloth moistened with a small amount of WD 40. Then wipe this off with a dry part of the cloth. This will keep the components free of dust and dirt.

Servicing.

Depending on the amount of use I believe it is important that these cameras are occasionally serviced. Some basic lubrication to the stacked gears can be done by the user but a full service needs some stripping down.

My suggestion is that a regularly used camera should perhaps be serviced every 5 years. Heavily used cameras will need more regular attention (say every three years). There are companies such as ARAX that can do this at a very reasonable price which may save a major failure later on.

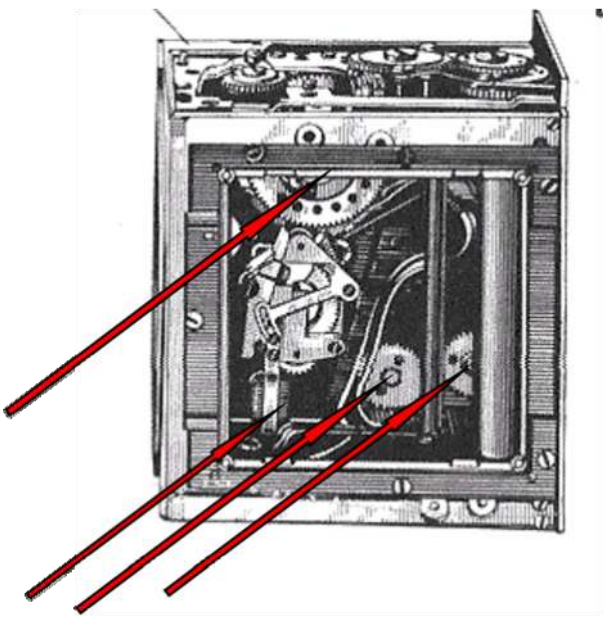
However it is quite feasible to service your own camera if you have proved yourself competent at doing some of the repairs suggested in this manual. I am assuming that the camera has been cleaned at some stage; it should not be necessary to repeatedly flood clean a camera if it has been done thoroughly once.

To fully lube the camera it is necessary to remove:

1. The focussing screen,
2. The lens mount,
3. The mirror,
4. The internal baffles.

You will need a diabetic syringe to hold the oil – mentioned further on in the manual.

Please look at the following illustration to see some of the points which need a drop of high quality light watch oil:



Essentially these points are:

1. The stacked gears assembly pivot, right through the central disks to the base. It may help to progressively wind the camera as you lube. Also include the silver bracket-like structure which goes from the top of the stacked gears to the shaft in the side of the camera; include the shaft as well.
2. The geared shutter tensioning spring pivots (lower arrows in the picture).
3. The paddle wheel on the slow speeds mechanism and EXTREMELY sparing lubrication of the gear shafts, please use a cocktail stick and avoid the large central gear which contains a one-way clutch.
4. The pivot points for the axle shutter curtain axle shafts on both side of the camera – with extreme care these can be reached with a diabetic syringe. This is an important area as steel is running under load in brass and needs some lubrication.
5. The shutter release and lens lock mechanism.
6. The mirror pivot points.
7. Lastly remove the winding knob as instructed further on, after following the precise procedure of setting to ‘B’ etc. and **without disturbing anything** apply a spot of oil to each gear pivot in the winding/speed change mechanism.

Now re-assemble the camera and wind the shutter through all speeds to distribute the oil.

How the camera works

It is good to have a basic understanding of how these cameras work. The following description applies specifically to the Kiev 88.

Tensioning of the blinds.

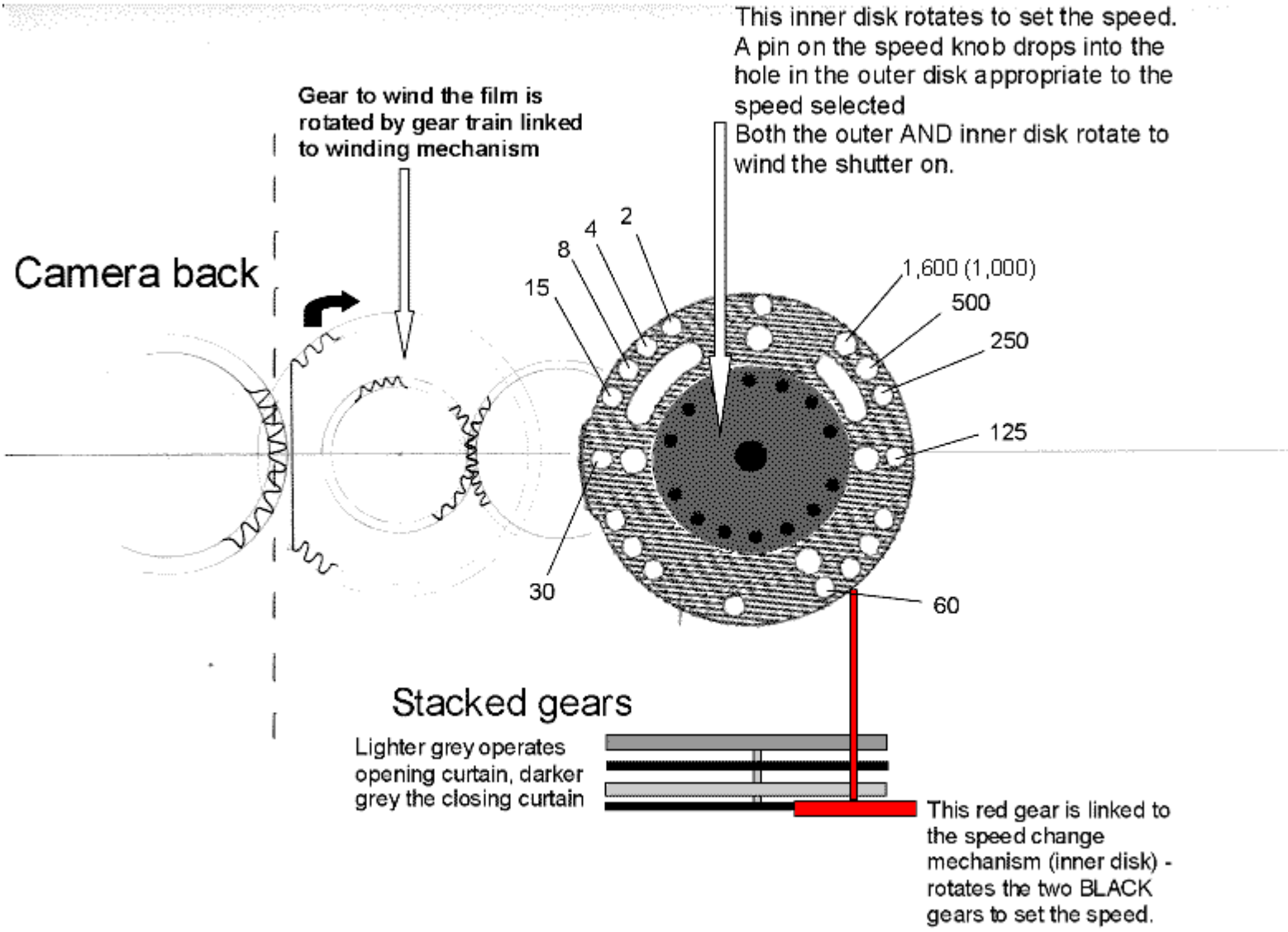
The tensioning mechanism consists of two gears with coil springs inside. These are tensioned by adjusting screws on the front of the assembly.
As the camera is wound, the unfurling blinds apply more tension to the springs.
When the shutter is released, the gears pull the blinds back to the resting position.

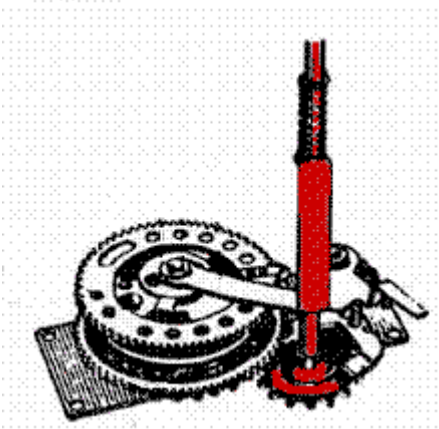
Speed selection/winding mechanism.

This assembly is extremely complex. Any slight mis-adjustment of one of its several gears will render the camera useless. The simultaneous events occurring are:

1. The inner and outer disk in the diagram below rotate together as the wind knob is rotated.
2. The train of gears linked to the gear that winds the film back starts to rotate. The large gear with the cutout, visible when the back is off the camera, winds a tensioned gear in the film back to advance the film. This gear also sets the tell-tale in the back to WHITE. When the cutout aligns again with the gear in the film back, a pin visible above the cutout gear is pushed into the camera back to release the gear, which springs back round to its starting position again.
3. The cutout gear also operates the camera tell-tale to show WHITE.
4. At the same time, the shutter blinds are being wound on, and the pair of stacked gears in the shutter speed mechanism advanced to the start position. These elements are locked together by the straight and bevelled gears in the speed selector/winding assembly, on the curtain rollers and in the body itself.
5. A lever on the stacked speed gears tensions the slow speeds air brake.
6. The lens diaphragm lever is moved forwards to open the lens diaphragm.
7. The camera body tell-tale is lifted and latched to show WHITE.

There is a ratchet which catches in the gear teeth of the wheel linking the winding mechanism with the large cutout gear to prevent the whole tensioned operation from springing back if one stops half way through the wind.


This inner disk rotates to set the speed.
A pin on the speed knob drops into the hole in the outer disk appropriate to the speed selected
Both the outer AND inner disk rotate to wind the shutter on.
Gear to wind the film is rotated by gear train linked to winding mechanism
Camera back
2
4
8
15
1,600 (1,000)
500
250
125
30
60
Stacked gears
Lighter grey operates opening curtain, darker grey the closing curtain
This red gear is linked to the speed change mechanism (inner disk) - rotates the two BLACK gears to set the speed.



Speeds are selected as follows:

1. The speed selector/wind knob is pulled out, along with the inner disk in the diagram above, to which it is attached. This disengages a pin on the knob which is engaged in one of the holes in the outer disk equating to the selected shutter speed.
2. As the knob is wound, a gear rotates the red shaft linked to a large black gear on the bottom of the speed assembly. This has teeth which allow the shutter release to engage and lock it when the shutter is fired.
3. This black gear is linked to a ramp like disk in the middle of the stacked gears. There is a complex set of pins and springs which are positioned during rotation to give the selected speeds.

4. For the lower speeds (1/15th and less), the slow speeds air brake is engaged to give a delay to the stacked gears.
5. Once the appropriate speed is selected, the pin in the knob drops into the hole for that speed.

Firing the shutter

1. The release is pressed.
2. A lever running the length of the base of the camera is pushed back. If the darkslide is in the back, it is unable to pass through it and so prevents the shutter firing.
3. Assuming the darkslide is out, a pin in the shutter release mechanism now engages and locks the black gear on the base of the stacked gear assembly.
4. A lever is operated, which releases the mirror.
5. The diaphragm operating ramp flies back, stopping down the diaphragm.
6. The stacked gears are released from their locked state.
7. The lower gear starts to move, and with it the opening shutter blind.
8. At a point predetermined by the set speed, the lower gear triggers the top gear to move. This is triggered through the pins and catches in the centre disk between the stacked gears.
9. For slow speeds, this trigger is delayed by the intervention of the **slow speeds air brake.** This device is tensioned by the stacked gears, and the speed of discharge is given by a bladed rotor which spins round as it is released. Nominal run-out time is one second; the stacked gears engage it for various periods from 1/15th to ½ second.
10. The lever mentioned in 2) above passes into the film back and resets the tell-tale to RED
11. The latch holding up the tell-tale in the camera body is released so it too turns to RED.

Camera disassembly

Basic disassembly and repair

If your camera was working correctly and has suddenly developed a fault, for example shutter banding or the blinds sticking partly open, it is best to start with a minimal dismantling, disturbing as few major components as possible.
Basic lubrication and inspection can be carried out with minimal dismantling.

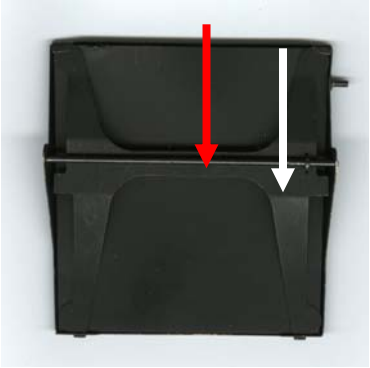
Before you even start…

1. Get a some pieces of A4 paper, a pen and some Cellotape.
2. Cellotape all small screws and components to the paper, with notes as to orientation and location.

Remove the focussing screen.

Salyut 'C', Kiev 80/88: This is held in by 4 screws and 4 tabs. Take care not to lose or drop them!
Zenith 80, Salyut: Again held by 4 screws and tabs but there is no frame holding the ground glass and Fresnel screen together. There are also four tiny clear plastic spacers, one in each corner.

Remove the mirror.



The mirror is removed by depressing the spring (white arrow) underneath the mirror and sliding the thin axle (red arrow) across. Notice the axle has a flange which engages in a slot in the spring – you need to depress the spring to free the flange from the slot and slide the axle away. The axle is arrowed in the picture; the flange/slot is circled.

You will need to gently pull down the mirror frame and ease the mirror itself out.

Please use the ZOOM facility in PDF editor to look more closely at the image.

Remove the internal light baffles

This is a fiddly job and it is easy to bend the baffles if you are not careful.

1. Remove the screw holding the bottom baffle to the front tripod mount.
2. Where fitted, remove the crescent shaped arm which stops down the lens aperture. Best to unscrew it at its pivot point with a small pair of pliers.
3. Free the bottom baffle from the tab at the back of the camera.
4. Starting with the side baffle on the winding knob side, press down on the base baffle and pivot the side baffle inwards – you will need to free it at the top where it fits under the camera body. You will need to move the mirror bracket up and down a bit to get the baffle around it.
5. Now remove the baffle through the lens aperture.
6. Next pivot the bottom baffle upwards so it frees from the tabs of the other side baffle and remove it.
7. Now remove the other side baffle – this is fiddlier as it under laps the mirror arm, which needs some moving around.

Inspect the camera.

You will now be able to see all the working parts of the camera, and lubricate most of them.

1. Look for any foreign particles that may be caught in any gears. If there are any, and they are metallic, ask the question "Where did they come from and are they the cause of the problem."
   If there is anything obviously broken then really the exercise ends here.
2. Do NOT attempt any flood cleaning of the speeds mechanism at this stage as the fluid gets between the body and the outer casing. From there by capillary action it will work its way into areas where you do not want it to go.

Lubricate the camera.

Please refer to the *'Lubrication'* section under *'Cleaning.'*

Exercise the shutter.

1. Now operate the camera a few times at 'B'. The shutter blinds should snap open and shut very smartly.
2. Next run through all the speeds – if you had a specific jam-up, has this disappeared?
3. If you find the camera to be working well at this stage, please re-assemble it by reversing the *'Basic disassembly and repair'* sequence, and put a test film through it.
4. **If the camera still has a fault,** e.g. shutter jamming partly open or not gapping**:** first refer to the section *'Faults and how to correct them'* to see if you can isolate the cause of the problem. It is also possible to sort out at least the problem with the stacked gears clip at this stage of disassembly.

There is still a problem…..

Assuming it is possible to wind and set the shutter – if not go on to *'Removing the chassis from the body'*.
At this stage I recommend checking the timing of the winding/speed setting gears.

To check the correct timing of the winding/speed setting gears:

1. Wind the shutter and set it to 'B'
2. Fire it.
3. IMMEDIATELY fit a lockable cable release and lock it open. This will ensure the stacked gear is not disturbed when the winding gear is removed.

Now remove the winding knob assembly as follows:

1. Peel off the leatherette in the middle of the winding knob.
2. Remove the flat nut from the centre – again circlip pliers will fit the holes.
3. Lift off the winding knob.
4. ***If you have a Zenith 80 (and possibly the Salyut) i.e. cameras with pre-set diaphragm lenses – go to 6 – else go to 5.***
5. **Immediately mark the alignment of the components as follows:**
   a) The central flange containing 14 holes in two groups of 7 in relation to the surrounding flange with many holes and slots. I suggest two marks 90 degrees apart as alignment to the tooth is critical.
   b) ALL the gearwheel teeth in relation to an index mark you must scribe on the curved inner part of the winding casting (located at about 2 O'clock) TIP: start by putting a dot of colored paint on the tips of the teeth, a permanent mark can be made as soon as the mechanism is removed.
6. ***Zenith 80 and early Salyut ONLY***:
   Immediately mark the alignment of The central flange containing 14 holes in two groups of 7 in relation to the surrounding flange with many holes and slots. I suggest two marks 90 degrees apart as alignment to the tooth is critical. The design of the winding gear is different to the Salyut 'C' which makes marking of the gearwheels unnecessary.
7. Now unscrew the four screws holding the casting in place. NOTE: One is shorter than the others.
8. Now ease the mirror down by gently pulling on the arm that sets the lens iris. The mirror needs to be about half way down.
9. Carefully ease the winding gear out. It will be necessary to ease the mirror back up a little to clear a tab from the gearwheels. **If the ARAX MLU conversion is fitted, there is a lever which will need pressing down to clear the gears and allow the winding gear to be lifted out.**

10. **Cameras other than the Zenith 80/early Salyut:** Now re-align the painted/scribed marks.

    - Check their accuracy by referring to the section *'Now to align the winding gear correctly'* Take your time to do this.
    - If the check suggests an error in alignment, re-fit the winding mechanism with the new marks aligned TIP: use a different coloured paint to ensure the old marks are not lost.
    - Now re-fit the winding gear as in section *'Refitting the winding gear'.*
    - Test the camera.

Removing the chassis from the body.

Important notice before you start….

- Any work you undertake is at your own risk.
- Please refer to the FREE copy of the Kiev 88 repair manual on this CD.
- Also the FREE Kiev 88 parts manual on this CD which has some clearer illustrations.
- **Keeping screws etc. in the right order –** Get some bits of A4 paper and Cellotape. Tape each small bit, screws etc. to the paper with notes; sketch etc. to help with re-assembly.

1. Wind on the shutter and set it to 'B'
2. **Fire the shutter**
3. **NOTE:** if you cannot wind or set the shutter, go straight ahead with dismantling the camera; you will need to re-time the shutter as described later
4. Unscrew the lens mount from the camera.
5. Carefully peel back the leatherette around the lens mount and remove the 4 countersunk screws.
6. Where fitted, remove the flash hotshoe – carefully collect the bits and tape to a piece of paper in their correct order.
7. Remove the flash socket – a pair of circlip pliers in the holes will unscrew it. Again collect the bits and note the order they came out.
8. Where fitted, remove the disk which sets the flash to 'X' or 'FP'
9. Remove the tripod bushes. You will need to unscrew the small screw holding the internal bottom light baffle to the tripod bush and remove the crescent shaped piece that stops down the lens to get the front tripod bush out. Mind the shims that may be between the body and the casing.
10. Peel off the leatherette in the middle of the winding knob.
11. Remove the flat nut from the centre – again circlip pliers will fit the holes.
12. Lift off the winding knob.
13. If you were unable to wind, set the shutter to 'B' and fire, now go to 17, else go to next step.
14. ***If you have a Zenith 80 (and possibly the Salyut) i.e. cameras with pre-set diaphragm lenses – go to 16 – else go to 15***
15. **Immediately mark the alignment of the components as follows:**
    a) The central flange containing 14 holes in two groups of 7 in relation to the surrounding flange with many holes and slots. I suggest two marks 90 degrees apart as alignment to the tooth is critical.
    b) ALL the gearwheel teeth in relation to an index mark you must scribe on the curved inner part of the winding casting (located at about 2 O'clock) TIP: start by putting a dot of colored paint on the tips of the teeth, a permanent mark can be made as soon as the mechanism is removed.
16. ***Zenith 80 and early Salyut ONLY***:
    Immediately mark the alignment of The central flange containing 14 holes in two groups of 7 in relation to the surrounding flange with many holes and slots. I suggest two marks 90 degrees apart as alignment to the tooth is critical. The design of the winding gear is different to the Salyut 'C' which makes marking of the gearwheels unnecessary
17. Now unscrew the four screws holding the casting in place. NOTE: One is shorter than the others.
18. Now ease the mirror down by gently pulling on the arm that sets the lens iris. The mirror needs to be about half way down.

19. Carefully ease the winding gear out. It will be necessary to ease the mirror back up a little to clear a tab from the gearwheels. **If the ARAX MLU conversion is fitted, there is a lever which will need pressing down to clear the gears and allow the winding gear to be lifted out.**
20. Now re-align the painted/scribed marks as necessary and replace the painted marks with permanent ones by gently filing the tops of the gear teeth with a jewellers file to reveal silver metal.
21. The chassis can now be gently slid out of the body – watch out for the bass shims under the tripod bush mounting holes, AND there may be brass shims in the front of the camera to adjust the correct alignment of the rear of the chassis with the edge of the body.

Further disassembly

I do not recommend any further disassembly. I have removed and successfully re-fitted the stacked gears but it is an extremely difficult and tedious operation.
All necessary cleaning can be done from this level of disassembly.

<u>Removal of the slow speeds mechanism.</u>
This should not really be undertaken unless it proves faulty, even after cleaning.
Ideally the winding mechanism needs to be refitted to do this properly – please refer to the appropriate section for instructions on refitting.

1. Slightly wind on the shutter so the grey nylon stop in the stacked gears pulls clear of the sprung silver tongue on the slow speeds mechanism.
2. Unscrew and remove the front of the three screws securing the slow speeds mechanism.
3. Loosen the back two and slide the slow speeds mechanism free – rescue the washer(s) from under the mechanism where the front screw was – this is important as it positions the mechanism at the correct height to trigger the stacked gears.
4. Fully wind and release the shutter on ‘B’
5. Soak the slow speeds mechanism in a jar of automotive brake cleaner for a few hours.
6. re-fitting is the reverse of removal, though some trial-and-error adjustment of the position of the mechanism may be necessary on the eccentric mountings to get it to trigger correctly.

Cleaning

Materials

You will need:

1. Automotive brake cleaner,
2. A large syringe or rubber bulb which can be used to suck up/spray out the brake cleaner,
3. A Kilner type jar with a rubber sealing lid (to soak components in),
4. A soft small paintbrush such as an artist's paintbrush.

Cleaning.

1. Soak the winding mechanism and the slow speeds mechanism in the jar of brake cleaner for a few hours. You may be surprised at the amount of dirt which comes out!
2. Taking great care NOT to soak the shutter curtains, use the syringe to carefully flood clean the stacked gears. Judicious tilting of the camera will ensure the fluid runs away from the curtains and out of the camera.
3. Similarly clean the shutter tensioning springs and drums (located at the back of the camera.)
4. Now use a paintbrush to apply cleaning fluid to the brass bevel gear in the camera, which engages with the bevel gear in the winding mechanism.
5. Keep changing the flushing fluid until it runs clean – you may be surprised by the amount of debris washed out of the camera.

Lubrication

You will need:

1. A good quality synthetic watch oil suitable for the watch movement (oils come in varying viscosities and you will need to be specific.)
2. A pack of diabetic syringes (cheap option) or a watch oiler (expensive.)
3. Some wooden cocktail sticks.

- When lubricating the camera, the shutter cocking mechanism should be re-fitted to the camera so it can be wound on and fired to work in the oil. ***Please refer to the appropriate sections further on to correctly time the shutter, and to fit the winding mechanism.*** This is good practice for when it has to be done with the camera back in the bodyshell!
- Work your way logically around the camera when applying oil.
- When filling the diabetic syringe, remove the plunger and poor the oil into the plastic tube.
- **Safety first…. Always put the cover over the hypodermic needle when not in use!**

Apply a drop or two of oil to the following areas:

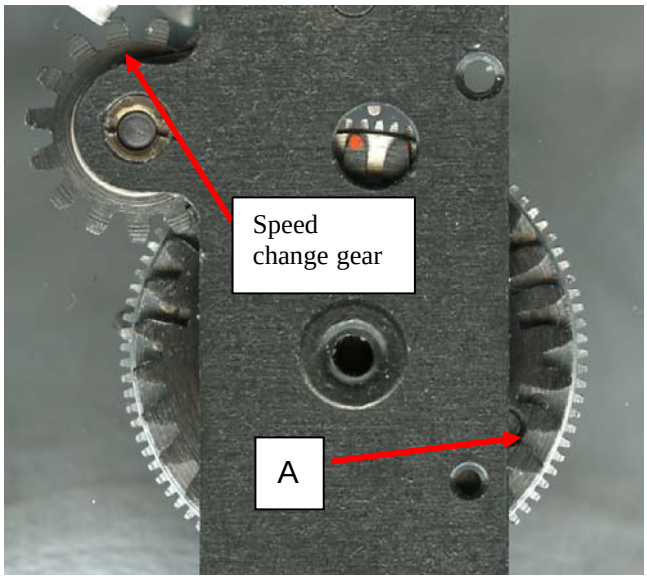
1. The axles and moving parts of the winding mechanism (before fitting to the camera.)
2. The axles and bearings of the shafts to which the shutter curtains/cords are attached (both sides of the camera, top and bottom.)
3. The pivoting parts of the mirror frame,
4. The top, and inner part of the stacked gear assembly,
5. The pivot of the associated small black gear on the base of the stacked gear assembly,
6. The tall thin axle coming away from the stacked gear assembly.
7. The pivots in the centre of the tensioning spring drums.
8. *The very tiniest amount of oil* to the pivots on the slow speeds escapement. If any oil gets onto the large gear in the centre, it will inevitably get into the one way clutch, making it slip and so not deliver any slow speeds. If this happens the slow speeds mechanism will need removing and cleaning again.

Help with correctly setting the shutter up on Kiev 80/88/Salut

This is **absolutely critical** to get right so take your time.

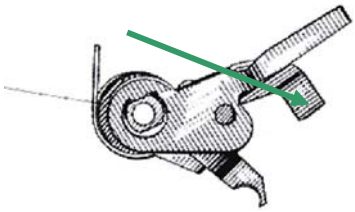
To get the stacked gear speed set to 'B'.

Look at the picture below and align your gear EXACTLY as per my picture.



HINTS:

1. Take note of the position of the small hole 'A'
2. Look at the positions of shallow and deep teeth – this will help you get the right alignment
3. When you think you have the correct position, turn the camera over and press the shutter release lever (see diagram below.)



The peg arrowed in green should fit into a cut-out in the gear labelled '**speed change gear'** in the photo of the bottom of the stacked gears on the left.

4. At the same time, the little tooth just visible above the dot of red paint on the gear in my picture should fit right into the stacked gear tooth.
5. Keep trying until you get this right, and then put a dot of red paint as I have done to aid correct alignment later.
   Eventually you will become so familiar with the alignment that it will become second nature to you.

Now to align the winding gear correctly.

Here is a picture of how the winding gear should appear at the 'B' setting

- The outer ring with all the long narrow holes should be secured in the sprung metal clip.
- The inner ring with the 14 holes in two groups: position so that the 4th (i.e. middle) hole of one of the groups of seven is upwards and parallel with the two holes in the outer ring. This equates to 'B'
- **Kiev 80/88 and Salyut 'C' only**. Now it is necessary to check that the timing gear for the blind release is set correctly – please see next picture:

1. Carefully wind gear 'A' clockwise (view from above). This will move gear 'B' anti-clockwise.

2. Keep going until the gearwheels meet a stop.
3. Now move gear ‘A’ anti-clockwise whilst carefully counting the number of teeth that gear ‘B’ moves in a clockwise direction.
4. The correct alignment is with **gear ‘B’ moved 4 teeth clockwise from the stop.**
5. This should align with the marks you made originally. If not double-check. If the shutter was jamming this could be the reason, i.e. someone had messed up the correct position of gear ‘B’
6. **Mark the teeth with a bright coloured dab of paint.**

Re-fitting the winding gear – Zenith 80 and early Salyut.

There is a very important design difference with these cameras, which affects their re-assembly.

1. These cameras do not have the additional gear in the winding mechanism which rotates backwards as the shutter is fired. This is the gear which normally has to be rotated a precise number of teeth from its stop to ensure correct operation of the shutter.
2. Look carefully at the brass vertical shaft in the camera, the one with the bevelled gear which engages with the winding mechanism.
   You will see that, with the shutter fired, it rotates quite freely. You will also note a toothed end at the top which will engage in a female toothed shaft above it.
3. Now look at the winding mechanism – you will see a lever at the top of the winding mechanism – this engages with the top female toothed shaft and presses it into, an out of, engagement with the brass vertical shaft. When engaged it enables the shutter to be wound on. When released, it allows the shutter curtains to open.
4. ***Therefore the important difference in operation is that, when the shutter is fired, the brass vertical shaft is dis-engaged and rotates freely with the shutter curtains – <u>there is no movement of any gears in the winding mechanism when the shutter is fired.</u>***

Luckily this makes re-fitting of the winding gear much easier in the Zenith 80/Salyut.

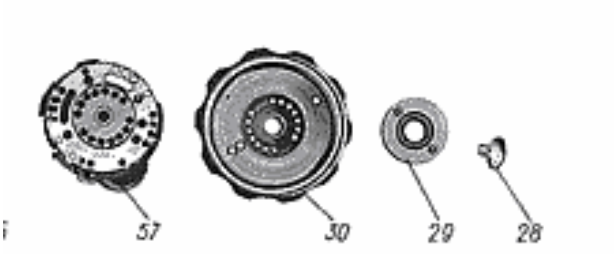
1. Ensure the scribed marks on the front of the winding gear are lined up.
2. Make sure that the little pivoting lever at the TOP of the winding gear mechanism is facing upwards.
3. If the re-fitting is being done with the chassis back in the body, fit a cable release and lock the shutter button in. This will prevent the position of the stacked gears being disturbed.
4. Now ease the lower bevelled gear down toward the brass bevel gear on the curtain shaft.
5. It is now necessary to pull the mirror down manually approximately half way to fiddle the bevelled gear around the mirror cam. Ensure the keyed lever on the mirror lever on the speeds gear engages with the keyed spigot on the mirror cam. THIS CAN BE A FIDDLY JOB.
6. It is important to ensure that the centre disk on the winding assembly (with the 14 holes in two groups) does not get disturbed.
7. Also ensure that the bottom black gear of the stacked gear setup does not get disturbed – the small tooth on the shutter release assembly MUST fit into the gear tooth when the shutter release is pressed.
8. Now fit the top screw loosely.
9. It is now necessary to manually pull down the top female toothed shaft mentioned earlier so it engages with the vertical brass shaft. This can be done with a screwdriver or fingernail.
10. Now ease the bevelled gear on the winding gear free from the brass vertical shaft. Gently rotate the brass vertical shaft to take up the slack in the toothed drive – this will ensure the curtains start to tension as soon as winding commences.
11. Now re-engage the gears and screw down the remaining screws.
12. Next fit the winding knob in place with ‘B’ uppermost. CLUE: the two pips on the inside of the winding knob should fit the two holes at the top of the outer ring of the winding assembly
13. Now fit the inner ring (with the two pips on it). You will need to look carefully into the inner part of the winding knob to see which set of holes align exactly and hence which to place the inner ring into.
14. Finally screw in the retaining disk in the centre of the winding knob.

Re-fitting the winding gear – Salyut ‘C’, Kiev 80/88

1. Make sure that the stacked gears and the winding gears have been correctly aligned as instructed.
2. If this is being done with the chassis back in the body, fit a cable release and lock the shutter button in. This will prevent the position of the stacked gears being disturbed.
3. Now ease the lower bevelled gear down toward the brass bevel gear on the curtain shaft.
4. It is now necessary to pull the mirror down manually approximately half way to fiddle the bevelled gear around the mirror cam. Ensure the keyed lever on the mirror lever on the speeds gear engages with the keyed spigot on the mirror cam. THIS CAN BE A FIDDLY JOB.
5. It is important to ensure that the centre disk on the winding assembly (with the 14 holes in two groups) does not get disturbed.
6. Also ensure that the bottom black gear of the stacked gear setup does not get disturbed – the small tooth on the shutter release assembly MUST fit into the gear tooth when the shutter release is pressed.
7. Once the winding gear snaps into place, ensure that the two inner gearwheels (see below) still line up with the index marks:

8. IF NOT: gently lift the bottom of the assembly so the bevel gear dis-engages from the brass gear on the curtain shaft.
   Then carefully turn the bevel gear until the gear marks line up.
9. Screw the assembly in place
10. Next fit the winding knob in place with ‘B’ uppermost. CLUE: the two pips on the inside of the winding knob should fit the two holes at the top of the outer ring of the winding assembly
11. Now fit the inner ring (with the two pips on it). You will need to look carefully into the inner part of the winding knob to see which set of holes align exactly and hence which to place the inner ring into.
12. Finally screw in the retaining disk in the centre of the winding knob.

Components of the winding knob:

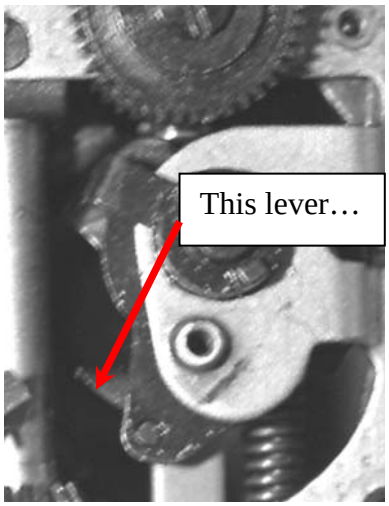


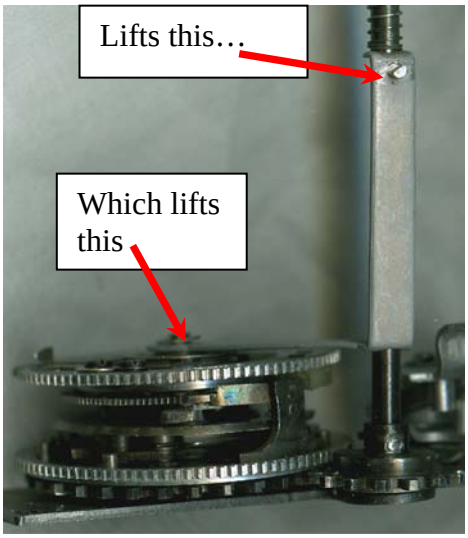
Faults and how to correct them

There is no shutter gap when the shutter is fired

To ensure the shutter gaps the following sequence of events occurs.

1. The shutter is pressed.
2. The mirror starts its journey upwards.



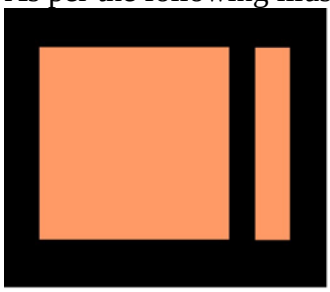


3. A sprung lever on the mirror pivot behind the winding mechanism (extreme left picture) catches a pin on the stacked gear assembly and lifts it.
4. This lifts the mechanism atop the stacked gears which arms the triggers inside the stacked gears (left hand picture.)
5. The stacked gears are then released and the appropriate gap is given.
6. The mechanism atop the stacked gears then drops back down to it's resting position

On my camera, I repaired this by some judicious bending of the lever to get it to raise the stacked gear mechanism. The fault is caused by wear in the sprung lever which prevents it from lifting the pin far enough.

The shutter jams partly open

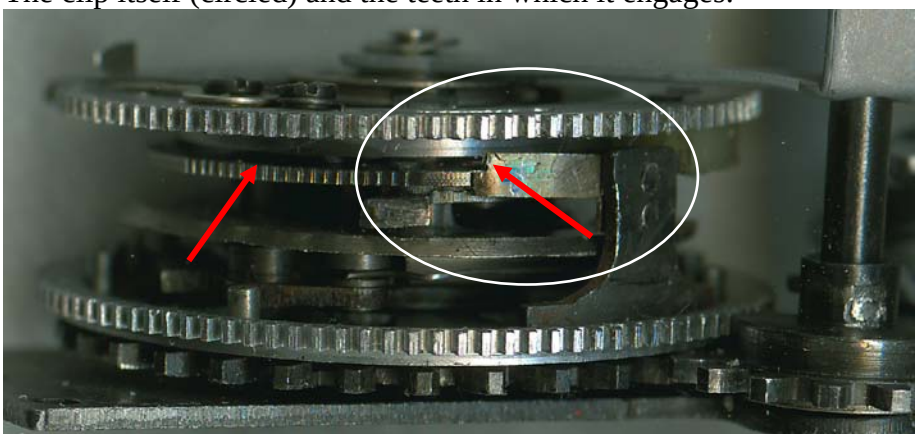
As per the following illustration, which shows the view from the back of the camera:



This can be caused by damage to a sprung clip on the lower stacked gear, which interacts with a toothed cam on the upper toothed gear. This sprung clip holds the stacked gears together when the shutter is advanced. It is then pulled clear so that the stacked gears can run off individually to give the select speed.

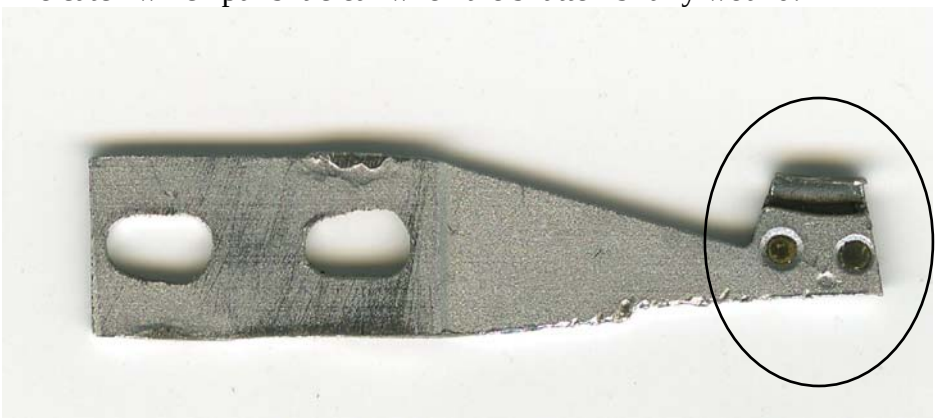
Illustrations next page:

1. The clip itself (circled) and the teeth in which it engages:



Please use the ZOOM facility to look more closely at the clip

2. The catch which pulls it clear when the shutter is fully wound:



3. ..and the relationship between the two:

4. With the shutter wound on, it is possible to look into the oblong hole in the top stacked gear and see if the catch is being pulled clear. It is the UPPER part of the clip that engages with the catch.

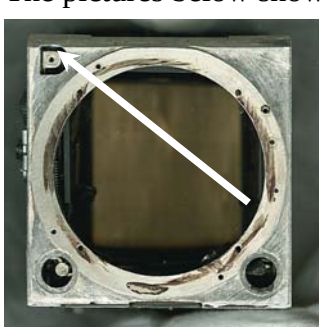
5. The UPPER part of the clip can be gently bent inward with a small jeweller's screwdriver. This will enable the catch to pull it further clear.

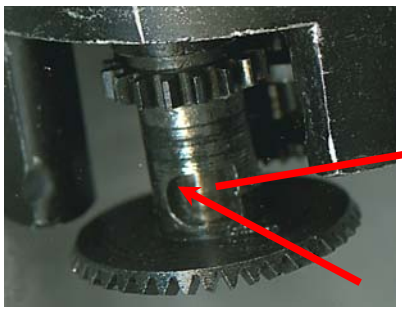
ARAX MLU (Mirror Lockup) conversion

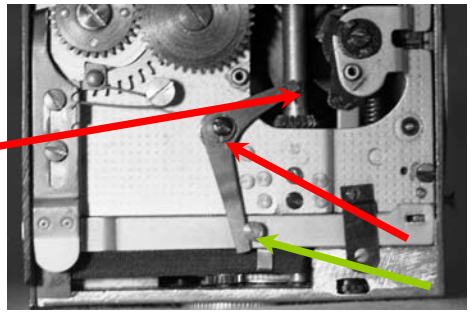
This is an ingenious modification which is achieved by:

1. Removing the chassis from the body.
2. Drilling into the front of the chassis and body shell.
3. Fitting a trigger lever behind this hole that releases the mirror when pressed
4. Modifying one of the gears in the camera winder by making a cut-out in the axle,
5. Fitting an additional sprung lever to the side of the camera, which is operated by a screw in the longitudinal bar, moved by the shutter release. The top end of this lever fits into the hole made in the axle in 3).

The pictures below show the stages 2, 4 and 5 above:







The camera is then re-assembled – the only evidence of the work is a small chrome button top left of the camera.
The MLU works as follows:

1. The shutter is wound.
2. When the MLU button is pressed, the action of the sprung lever on the hole in the modified gear axle prevents the shutter from releasing, as it normally would in an unmodified camera.
3. When the shutter release is pressed, the longitudinal bar moves and the additional screw, shown by the green arrow in the right hand picture above, pulls the lever clear of the hole.
4. The shutter is then released.

Faults with the MLU

The only one I have come across is that the pressing of the MLU button also triggers the shutter.
This is caused by the angled lever not engaging in the cut-out in the axle.

As the screw holding the angled lever incorporates an eccentric mount, this can be adjusted out by:

1. Winding the shutter,
2. Loosening the screw,
3. Turning the eccentric bush (with slots in it) until the tip of the lever drops into the cut-out.

Re-fitting the chassis into the body.

It will of course be necessary to remove the winding mechanism before this can be done.

1. Remove the winding mechanism.
2. Slide the chassis into the body and re-fit the screws on the front of the body that hold the chassis in place.
3. Now take a straight edge and check that the back of the chassis (the black frame around the shutter) is level or *very slightly* proud of the body. This is critical to ensure a good seal between the camera and film back. It may be necessary to slightly shim the chassis – the best option is some very thin shims from the scrap box, glued around the holes on the chassis where the screws in the front of the camera thread in.
4. Only when you are satisfied with this aspect can the final assembly begin.

To fit the chassis to the body:

1. Ensure that the stacked speeds gear has not been disturbed from its ‘B’ position.
2. Re-fit the little lever into the flash synchronisation mechanism.
3. Make sure that the MLU button (where fitted) is placed correctly in the body.
4. Ensure that the shutter release button is correctly placed in the body – the pin in the middle can fall out.
5. Slide the chassis into the body.
6. Fasten the retaining screws into the front of the body.
7. **IMMEDIATELY fit a cable release and LOCK THE SHUTTER IN THE FIRED POSITION.** This will prevent the stacked gears being disturbed.
8. Fit the tripod bushes.
9. refit the flash socket.
10. Now refer to the sections on refitting the winding gear – remember there are different instructions for the Kiev 88 and the Zenith 80/Salyut.
    Also bear in mind it is more fiddly to do with the body fitted.
11. I recommend testing the shutter for correct operation BEFORE fitting the baffles and the mirror – less to dismantle again should there be problems!!